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Patentanmeldung Nr. Patent application No. Demande de brevet n°

02256348.0

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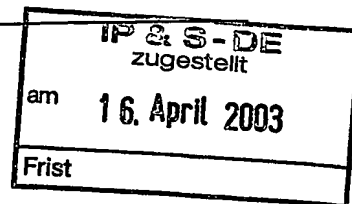
R C van Dijk



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Means for suppression of pass-band ripple in bulk acoustic wave filters

In Anspruch genommene Priorität(en) / Priority(ies) claimed / Priorité(s)
revendiquée(s)
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AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LI LU MC NL PT SE SK TR

The figures show different BAW resonators with absorbing layer to suppress passband ripple in a BAW resonator filter. 1= top electrode, 2= piezoelectric layer(e.g. AlN), 3 = bottom electrode, 4 = Bragg reflector, 5=absorbing layer, 6 = substrate, 7=roughened substrate.

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1. Roughening rear side of substrate (Fig. 1).
2. Adding an absorbing layer (e.g. epoxy glue) to the rear side of the substrate (Fig. 2).
3. Adding an absorbing layer on front of substrate and below Bragg reflector (Fig. 3).
4. Combination of means 1-3.

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In Fig.4 is shown an example of a BAW resonator filter curve in which the pass-band ripple is reduced by adding an absorbing layer on top of substrate (e.g.a glass substrate and epoxy glue as absorbing layer). The Bragg reflector is consisting of alternate $\lambda/4$ layers of SiO₂ and Ta₂O₅. On top of this reflector the bottom electrode Pt and the piezoelectric film is stacked. As top electrode is used Al. As can be seen, the pass-band is free of any ripple. This is due to the use of an absorbing layer underneath the Bragg reflector on top of the glass substrate. The absorbing layer used was epoxy glue. Other materials which can be used as acoustic absorber: viscoelastic materials such as polyimide, all kind of glue, rubber, plastic materials, porous media, porous thin films etc. in which either acoustic absorption mechanisms are dominant or acoustic scattering occurs.

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CLAIMS

1. Bulk acoustic wave filters comprising a substrate with a front side and rear side and a Bragg reflector wherein the rear side of the substrate is roughened.
2. Bulk acoustic wave filters according to claim 1,
5 comprising also an absorbing layer between the front side of the substrate and the Bragg reflector.
3. Bulk acoustic wave filters according to claim 1,
comprising also an absorbing layer at the rear front side of the substrate

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ABSTRACT

Means for suppression of pass-band ripple in bulk acoustic wave filters

Bulk acoustic wave filters comprising a substrate with a front side and rear side and a Bragg reflector wherein the rear side of the substrate is roughened.

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Fig. 1

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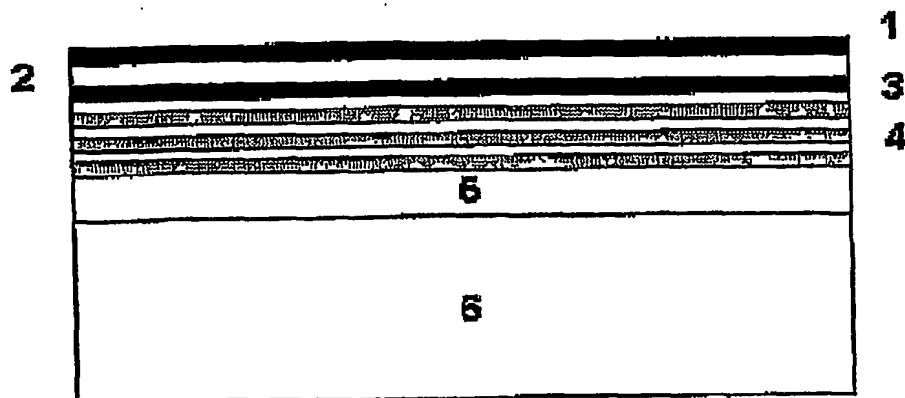


Fig. 1

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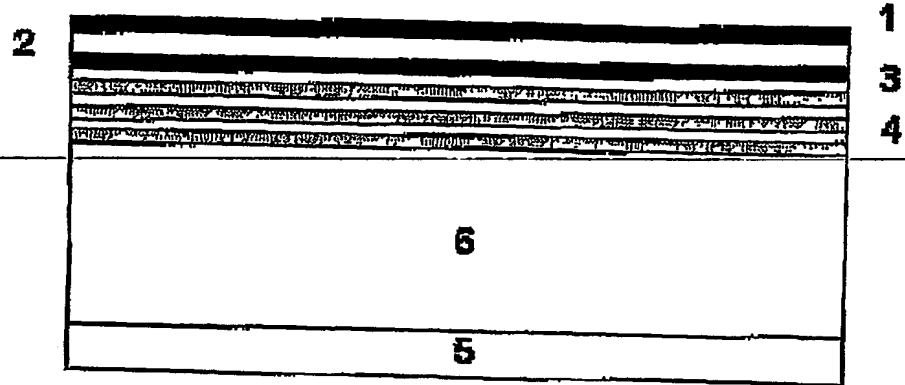


Fig. 2

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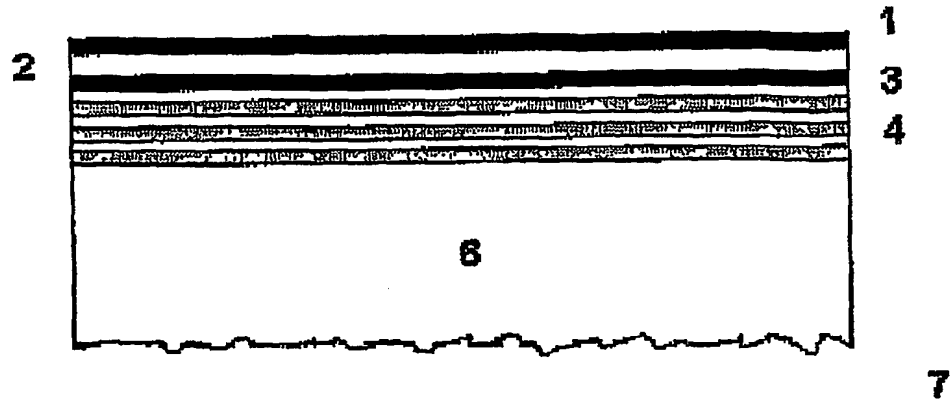


Fig. 3

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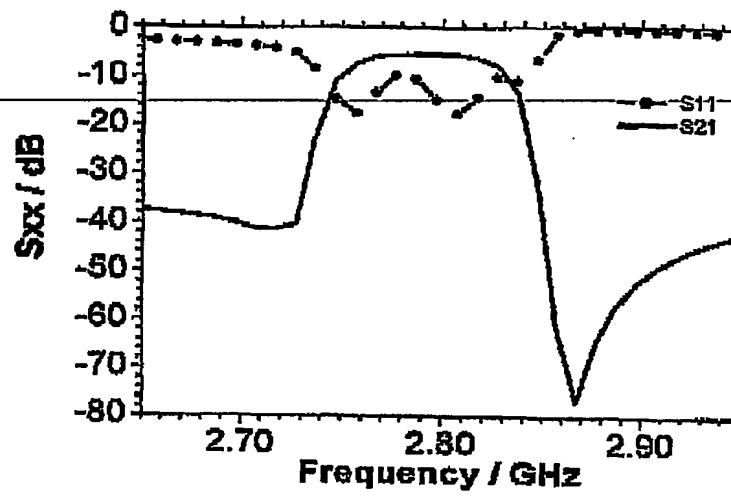


Fig. 4

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